

# Mobile memory clinic: implementing a nurse practitioner-led, collaborative dementia model of care within general practice

Dimity Pond<sup>A,G</sup>, Isabel Higgins<sup>B</sup>, Karen Mate<sup>C</sup>, Helga Merl<sup>D</sup>, Dianne Mills<sup>E</sup> and Karen McNeil<sup>F</sup>

<sup>A</sup>School of Medicine and Public Health, Office 134, The Building and Investment Centre of Excellence, University of Newcastle, 10 Chittaway Road, Ourimbah, NSW 2258, Australia.

<sup>B</sup>School of Nursing and Midwifery, RW227, Richardson Wing, University of Newcastle, University Drive, Callaghan, NSW 2308, Australia.

<sup>C</sup>School of Biomedical Sciences and Pharmacy, LS350, Life Sciences Building, University of Newcastle, University Drive, Callaghan, NSW 2308, Australia.

<sup>D</sup>Hunter New England Local Health District and Hunter Medicare Local. Present address: Wicking Dementia Research and Education Centre, Room B128, University of Tasmania, Private Bag 143, Hobart, Tas. 7001, Australia.

<sup>E</sup>Aged Care and Rehabilitation Services (LMNCS), Hunter New England Health District, Building 2, Level 1, 26 York Street, Taree, NSW 2430, Australia.

<sup>F</sup>School of Medicine and Public Health, Office 134, The Building and Investment Centre of Excellence, University of Newcastle, 10 Chittaway Road, Ourimbah, NSW 2258, Australia.

<sup>G</sup>Corresponding author. Email: [Dimity.Pond@newcastle.edu.au](mailto:Dimity.Pond@newcastle.edu.au)

**Abstract.** The limited capacity of secondary health services to address the increasing prevalence of dementia within the community draws attention to the need for an enhanced role for nurses working collaboratively with GPs in diagnosing and coordinating post-diagnostic care for patients with dementia. This study investigated the feasibility and acceptability of a nurse practitioner-led mobile memory clinic that was embedded within general practice and targeted to caring for patients and their carers in areas of socioeconomic disadvantage with poor access to specialist health services. Over the period from mid-2013 to mid-2014, 40 GPs referred 102 patients, with the nurse practitioner conducting assessments with 77 of these patients in their homes. Overall, there was a strong interest in this model of care by general practice staff, with the assessment and care provided by the nurse practitioner evaluated as highly acceptable by both patients and their carers. Nonetheless, there are financial and structural impediments to this model of care being implemented within the current Australian health service framework, necessitating further research investigating its cost-effectiveness and efficacy.

**Keywords:** dementia, GPs, home-based assessment, multidisciplinary care, nurse practitioners.

Received 14 May 2020, accepted 16 October 2020, published online 1 February 2021

## Introduction

There are over 400 000 people living with dementia in Australia, with this number projected to reach more than 1.1 million by 2056 (Dementia Australia 2020). However, a high proportion of people do not receive a timely dementia diagnosis, reinforcing the need to improve access to diagnostic services (Woods *et al.* 2019). Diagnosis facilitates provision of coordinated care, adjustment to the illness, forward planning and potentially delays admission to hospital or residential care (Dodd *et al.* 2015).

In high-income countries, diagnostic services for dementia patients are often provided by specialist physicians, or memory

clinics based in secondary care. Such models may not be able to cater for the increasing numbers of people affected by dementia (Dodd *et al.* 2015; Prince *et al.* 2016), with calls for primary care professionals to take on a greater role in diagnosing and coordinating post-diagnostic care (Aminzadeh *et al.* 2012; Pond 2017).

There are strengths in primary health that make it a natural fit for dementia care because it is 'more local, more holistic and personalised, and more comprehensive, integrated and continuous' than secondary care (Prince *et al.* 2016). However, there remain barriers to GPs providing timely diagnoses and effective dementia management. Many GPs lack dementia knowledge

and do not have confidence in diagnosis (Mason *et al.* 2020). Furthermore, reimbursement models in Western countries do not cater for the lengthy consultations needed to diagnose and manage dementia (Aminzadeh *et al.* 2012). Thus, it is not surprising that the prevalence of missed or delayed diagnoses is substantial (Pond *et al.* 2013; Woods *et al.* 2019); therefore, there is a need for innovative approaches in service delivery.

Solutions could include task-shifted and task-shared models of dementia care (Prince *et al.* 2016). Task shifting is defined as the delegation of specific tasks to less specialised health workers (World Health Organization (WHO) 2007); this usually involves task sharing between specialist and non-specialist services, with specialist clinicians often providing supervision and professional support (Prince *et al.* 2016). Task shifting from the medical to the nursing profession has been used to address physician workforce shortages and geographic maldistribution, particularly in primary care contexts (Maier and Aiken 2016).

Trials of task-shifted models where dementia services are embedded within primary care typically involve an expanded role for nurses (Dodd *et al.* 2015). The implementation of a task-shared (comanaged) model of geriatric care between nurse practitioners (NPs) and physicians in the US saw marked improvements in quality of care indicators for patients with dementia compared with patients receiving physician care alone (Reuben *et al.* 2013). Furthermore, a study of an NP-led, open referral memory clinic in Australia suggested that such a model may overcome some of the barriers to dementia diagnosis because patients may be more inclined to raise confronting issues with a nurse rather than a doctor (Minstrell *et al.* 2015).

In Australia, the title of 'NP' is legally restricted to nurses working at advanced practice nursing level, with a Masters qualification and who have been endorsed by the Nursing and Midwifery Board. The NP title is distinct from 'practice nurse', which is typically used to describe nurses employed within the general practice context (Nursing and Midwifery Board of Australia 2016). Recent analysis has identified that collaboration with other health professionals, particularly GPs, is a key factor in successfully implementing the NP role in primary health and aged care settings (KPMG 2018). Consistent with this evidence, active participation of GPs is warranted. GPs' long-term relationships with patients, their involvement in all aspects of a person's health and in excluding medical causes of cognitive impairment are likely to facilitate access to diagnosis and treatment. Therefore, a model of care that centres on NPs working collaboratively with GPs (Dodd *et al.* 2015) offers a viable alternative to the secondary care models described above.

In Australia, NPs are able to conduct advanced assessments, prescribe some medications, order and interpret diagnostic investigations and make referrals to other health professionals (Currie *et al.* 2016). For NP services to be eligible for subsidies through the Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS), NPs must have formal collaborative arrangements with a medical practitioner (Currie *et al.* 2016). Importantly, the evidence indicates that collaborative care provided by NPs and doctors together enhances patient outcomes and access to care (Clark *et al.* 2013). The NP role may meet a need for aged care support in rural areas, where GPs are thin on the ground and have little time to build an in-depth relationship with the family and develop collaborative goals

(Haines and Critchley 2009). The NP role is a relatively recent addition to the Australian context, thus justifying an investigation into the feasibility of using NPs within the general practice setting. Accordingly, in this study we evaluated an NP-led, general practice-based collaborative model of dementia care in an area that is poorly served by specialist medical services.

## Methods

### Design

This project incorporated elements of action research through the active involvement of stakeholders in implementing, evaluating and adapting practice improvements (Koshy *et al.* 2010). The aim was to explore how the dementia-aged care nurse practitioner (DACNP) role could be articulated within the primary care team to identify, assess and manage patients with early stage dementia. Specifically, the objective of the study was to develop a collaborative NP-led model of care that included dementia identification and the exclusion of other possible diagnoses, referral pathways, communication strategies and carer involvement. This project included patients within the community but excluded those living in residential aged care facilities. We evaluated the intervention in terms of patient and carer satisfaction and how effectively multidisciplinary collaboration and decision making (involving GPs, practice nurses and the DACNP) were enacted.

In late 2012, an NP was recruited to the role of DACNP with her salary funded from the research grant. After 12 months, this NP resigned to take up a continuing role elsewhere, due to the limited term of employment available with this project. This first incumbent recruited her replacement and provided training and supervision for the duration of the project. Each NP had clinical expertise in aged care and dementia, working to the same scope of practice and assessment protocol, which included a visit to the GP to discuss findings. Although both NPs were endorsed, each encountered difficulty in securing MBS and/or PBS authorisation, which restricted their capacity to order diagnostic investigations, prescribe medications or initiate referrals. At the time, there were few NPs with full MBS and PBS authorisation and relevant expertise in aged care in the region. Stakeholder consultation and refinement of the research design occurred from August 2012, and ethics approval was granted in March 2013. Patient assessment and data collection were undertaken from mid-2013 to mid-2014, with the first NP conducting most assessments (61 of 77).

The NP mobile memory clinic, developed in consultation with consumer, primary care and residential care representatives, was trialled in consenting general practices in regional areas of socioeconomic disadvantage. The NP was based in Newcastle, New South Wales, and home visits involved driving 1 h each way to these locations. More than one assessment could be conducted in a single day if patients lived in the same area, thus reducing the cumulative travel time. In line with the action research methodology (Koshy *et al.* 2010), the GPs and practice nurses provided regular feedback on the assessment process and report format, which was reviewed by the research team and operationalised as practice improvements. One example of a practice improvement was the addition of a single-page summary in response to GP feedback that the report was too long.

This finding was reinforced by a focus group of GPs held to review the referral and reporting process. In addition, in response to an identified need for training, a nurse educator was provided under separate funding to train practice nurses in cognitive screening so they were able to provide more detail on cognition when making a referral.

The research protocol was approved by the University of Newcastle Human Research Ethics Committee HREC (No. H 2012-0031). Informed written consent was obtained from all participants.

#### *Recruitment of general practices, including GPs and practice nurses*

A list of possible GP participants was prepared in consultation with the local primary care organisation. Recruitment efforts targeted outlying regional areas of Newcastle with aging populations and higher levels of socioeconomic disadvantage. Patients in these areas often experience difficulty accessing public geriatric services due to lack of available transport, and the cost of private consultations can be prohibitively expensive for those on low incomes. Project team members then contacted the nominated GPs and arranged for a visit by the NP accompanied by the practice liaison officer from the primary care organisation. During the visit, practice personnel (GPs, practice nurses and practice managers) were provided with information about the project, consent forms and the process for referring patients to the DACNP.

#### *Recruitment of patients and carers*

Patients were identified by their GP or practice nurse as having a possible cognitive impairment and referred to the project by secure fax using a method previously trialled by the team (Convery *et al.* 2013). The GP referral constituted a formal collaborative arrangement as required by the MBS (Currie *et al.* 2016).

#### *Process and data collection*

On receiving the GP referral, the DACNP conducted a comprehensive assessment with the patient at their home and, if available and with patient consent, spoke to their carer. For patients, the assessment included the Cambridge Cognitive Assessment – Revised (CAMCOG-R; Roth *et al.* 1988) to assess cognition, the Bristol activities of daily living (ADL) scale (Bucks *et al.* 1996), the Quality of Life in Alzheimers Disease (QOL-AD; Logsdon *et al.* 2002) tool and the Cornell Scale for Depression in Dementia (Alexopoulos *et al.* 1988; Convery *et al.* 2013). Anxiety was assessed using the short form of the Geriatric Anxiety Inventory (GAI-SF; Byrne and Pachana 2011). Carer assessment included the Zarit burden scale (Zarit *et al.* 1980), the World Health Organization Quality of Life assessment – short version (WHOQoL-BREF; WHO 2020) to measure quality of life and the Brief Cope scale (Carver 1997; Convery *et al.* 2013). Mood was assessed using the Depression Anxiety Stress Scales – short form (DASS-21) (Lovibond and Lovibond 1995). The mean length of the assessment conducted by the NP in the patient's home was 2 h. This model was different from care provided at the GP practice in that it included an assessment of the person's living conditions, a full range of screening instruments and an advance care plan (ACP).

Following this assessment, the DACNP compiled a report using a format developed in collaboration with the GPs and forwarded it to the patient's GP.

The DACNP also participated in case conferences with the GP and practice nurse covering such issues as cognition, patient living conditions, ADL and the ACP. These case conferences were reimbursed to the GP by the MBS. The NP would not have been eligible for MBS funding for case conference visits because patients were not present. The case conferences also contributed to the cyclical process of practice improvement.

Surveys were distributed to all patients and carers assessed by the DACNP to determine satisfaction with the model of care. These were completed anonymously and returned to the university in a prepaid envelope.

## Results

#### *Recruitment of GPs, patients and carers*

Overall, 57 GPs were recruited from 30 practices, with 40 referring patients to the DACNP. Most practices were small or medium-sized (typically employing fewer than 10 GPs; Swerissen *et al.* 2018), with only four contributing more than 2 GPs to the project. In summary, GPs and practice nurses identified patients with possible cognitive impairment and referred them to the DACNP. The patients consented to this referral in writing. The DACNP assessed 77 patients of the 102 patients in total referred by the GPs. Fig. 1 shows the number of the patients referred, excluded from the project and assessed.

Patients were referred if the GP had concerns about their cognition and they were unable to access specialist assessment. As part of the referral process, GPs were able to indicate which assessments they did not want the DACNP to conduct, as well as being able to suggest additional items that could be broached with the patient.

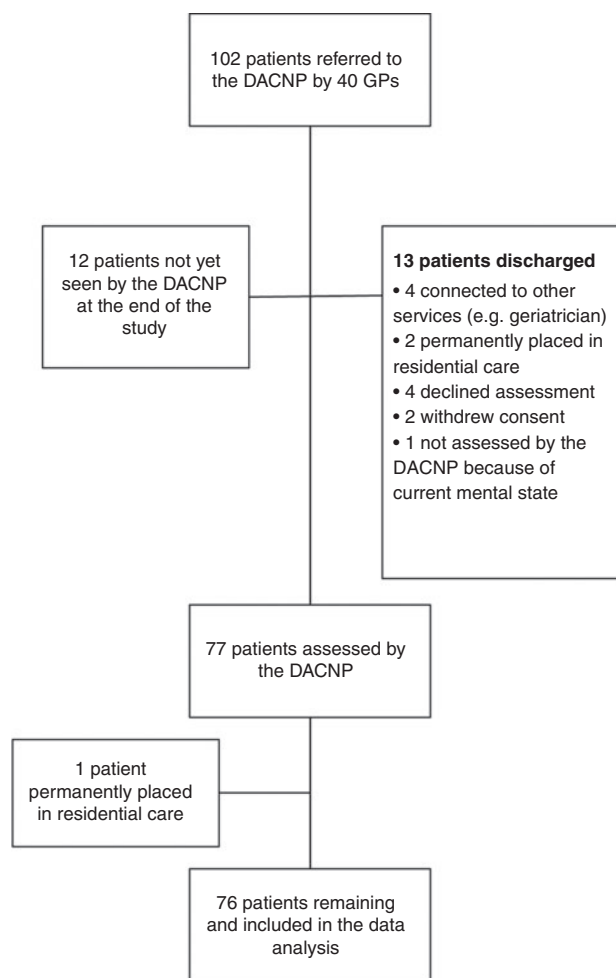
#### *Patient and carer assessment results*

The demographic characteristics of patient and carer participants are provided in Table 1. Twenty-seven patients participating in the study consented to having their carer involved.

Of the 76 patient participants for whom scores were analysed, 24 scored in the dementia range (CAMCOG-R score <80). No significant differences were found on all other scales between patients diagnosed with dementia and or not.

The DACNP made 19 firm diagnoses of dementia, 31 diagnoses of mild cognitive impairment (MCI) and 24 definite diagnoses of no dementia. The DACNP was unable to make a firm diagnosis in two patients. One of these patients fell in the dementia range on the CAMCOG-R, whereas the other patient was in the 'normal' range. It is important to note that the DACNP judged 68% of patients as fitting into the MCI and dementia range, whereas the CAMCOG-R only classified 49% as borderline or in the dementia range. Similarly, not all patients falling into the dementia range on the CAMCOG-R were diagnosed with dementia. Some patients scoring in the dementia range were seen as having reversible causes of cognitive impairment and others experienced no impairment in ADL, so were not diagnosed as having dementia.

Further analysis of the NP diagnoses using one-way analysis of variance (ANOVA) found a significant difference,



**Fig. 1.** CONSORT diagram for patient referral and assessment. DACNP, dementia-aged care nurse practitioner.

( $P \leq 0.001$ ) for the CAMCOG-R between patients with no diagnosis of dementia, a diagnosis of MCI and a diagnosis of dementia (Table 2).

Following the assessment, the DACNP made recommendations to the referring GP regarding further diagnostic investigations, follow-up assessments and/or referrals to other services. The nature and frequency of these recommendations are provided in Table 3.

Although differences in scores were found between carers of dementia patients and carers of non-dementia patients, none of these differences was significant.

#### Patient and carer satisfaction survey results

In the main, patients and carers found the assessment process conducted by the DACNP both highly acceptable and very useful. Most carers felt reassured about being asked questions of their role as a carer. The results of these surveys are detailed in Table 4.

#### Discussion

The results of this study indicate that the NP model could effectively improve assessment of patients for dementia in a

**Table 1.** Patient and carer characteristics according to score on the CAMCOG-R

Data are given as the mean  $\pm$  s.d. or  $n$  (%). CAMCOG-R, Cambridge Cognitive Assessment – Revised

	Dementia (CAMCOG-R <80)	Non-dementia
<b>Patient characteristics</b>		
No. patients	24	52
Participant age (years)	77.13 $\pm$ 9.81	74.94 $\pm$ 8.03
Sex		
Male	9 (37.5)	20 (38.5)
Female	15 (62.5)	31 (59.6)
Level of education		
No school certificate	7 (29.7)	18 (34.6)
School or intermediate certificate <sup>A</sup>	12 (50.0)	12 (23.1)
Post-school, certificate, diploma or degree	3 (12.5)	16 (30.8)
Missing	2 (8.3)	6 (11.5)
<b>Carer characteristics</b>		
No. carers	10	17
Carer age (years)	68.22 $\pm$ 13.51 <sup>B</sup>	64.76 $\pm$ 9.81
Sex		
Male	1 (10)	5 (29.4)
Female	9 (90)	11 (64.7)

<sup>A</sup>Includes high school leaving certificate or trade/apprenticeship.

<sup>B</sup>The number of carers was 9 for the group of patients with dementia.

primary care setting. There was a strong interest in this service by GPs and practice staff, as indicated by referrals and participation in case conferences, and the model of care was highly acceptable to both patients and their carers, as indicated by the satisfaction surveys. Carer reassurance is critical, even when dementia is diagnosed, because it enables carers to move onto acceptance of support services in full knowledge of the prognosis.

The recruitment of GPs progressed smoothly, with many expressing an interest in the service that the DACNP offered. Indeed, such was the demand that, due to time pressures, 12 patients had not been seen by the DACNP by the conclusion of the study. These patients were referred back to their GP to organise an alternative assessment. Such results are consistent with research that time constraints pose a barrier to GPs effectively identifying patients with dementia (Koch and Iliffe 2010).

Survey results indicating that the assessment conducted by the DACNP was almost universally well received by the patients and their carers was in accordance with other studies (Clark *et al.* 2013; Helms *et al.* 2015). Because the NP did not make a diagnosis of dementia in all patients who scored below the cut-off point on the CAMCOG-R, clinical judgement and appraisal of contextual features not detected by the CAMCOG-R played a key role in the investigation of memory-related issues.

The provision of an ACP provided both the person referred and their carers with an understanding of what choices that person would make as dementia progressed. An ACP reduces unnecessary hospitalisation and increases control over the end of life, with high concordance between care received with prior choices and wishes of the patient (Wendrich-van Dael *et al.* 2020). Although GPs are usually familiar with ACPs, the



**Table 2. Results of one-way ANOVA of patient age and scores on assessment tools according to the diagnoses made by the dementia-aged care nurse practitioner**

CAMCOG-R, Cambridge Cognitive Assessment – Revised; GAI-SF, short form of the Geriatric Anxiety Inventory; MCI, mild cognitive impairment; QOL-AD, Quality of Life – Alzheimer's Disease

	No diagnosis		MCI		Dementia		P-value
	n	Mean $\pm$ s.d.	n	Mean $\pm$ s.d.	n	Mean $\pm$ s.d.	
Age	24	72.33 $\pm$ 9.18	31	76.84 $\pm$ 6.78	19	78.68 $\pm$ 8.90	0.037
CAMCOG-R (104 <sup>A</sup> )	24	90.71 $\pm$ 5.89	31	82.23 $\pm$ 9.54	19	67.11 $\pm$ 14.43	<0.001
Cornell Depression scale (38 <sup>A</sup> )	23	9.61 $\pm$ 4.91	31	6.77 $\pm$ 5.62	19	8.74 $\pm$ 7.19	0.302
GAI-SF (5 <sup>A</sup> )	23	2.87 $\pm$ 2.07	31	1.87 $\pm$ 1.88	19	2.32 $\pm$ 2.00	0.319
QOL-AD (52 <sup>A</sup> )	22	31.73 $\pm$ 6.24	31	34.87 $\pm$ 6.71	18	34.89 $\pm$ 7.22	0.321

<sup>A</sup>Possible score.**Table 3. Recommendations made by the dementia-aged care nurse practitioner (DACNP) to the GP who referred the patient (n = 76 patients)**

ACD, advance care directive; ACP, advance care plan; CT, computed tomography

Recommendation made	No. patients
Order a CT scan	40
Order pathology	46
6-month patient follow-up	48
12-month patient follow-up	6
ACP or ACD to be completed by the DACNP at a follow-up appointment	22
ACP or ACD to be completed by a connecting care worker	2
Medications review	23
Mental health plan, including referrals to specialist mental health service for older people	19
Referral to dementia nurse	2
Referral to geriatrician	5
Referral to the aged care assessment team	5
Referral to community nurse	1
Referral to physiotherapist	2
Referral to psychologist	4
Referral to psychogeriatrician	1
Referral to neuropsychiatrist	5
Trial Souvenaid <sup>A</sup>	13
Respiratory assessment	3
No further action required	1

<sup>A</sup>Souvenaid is a medical nutrition drink to support memory function in early Alzheimer's disease.

structure of general practice is a barrier to plan completion (Tilburgs *et al.* 2018).

The DACNP was successful in the early identification of dementia, assessment, management and linking patients and carers with available support services. Of the 76 patients assessed by the DACNP, 31 were diagnosed with MCI and 19 were diagnosed with dementia, pointing to the fact that, in most cases, referral to the DACNP was appropriate.

Seventy per cent of GPs recruited to the study referred patients, a high response rate for primary care. There has been a growing acceptance of the NP role among the medical profession, particularly where collaborative relationships have

fostered an understanding of, and respect for, the skills and expertise of NPs (MacLellan *et al.* 2015). This augurs well for future collaborations between GPs and NPs working in dementia care and management.

There were other positive outcomes of the study: the practice nurses frequently attended the case conferences with the NP and the GP and thus learned about local referral pathways for people with early signs of dementia, as did the GP. In addition, funding was found to educate the practice nurses in administering cognitive function tests.

One of the most significant barriers to the DACNP's scope of practice was the fact that both incumbents had difficulties securing PBS and MBS authorisation, limiting investigation, prescribing and referral. However, current MBS provisions preclude even authorised NPs ordering some investigations and referrals (Helms *et al.* 2015), with removal of these restrictions recently recommended by an MBS taskforce (MBS Review Taskforce 2018).

Several concerns were raised by the NPs themselves about the financial viability, and therefore sustainability, of the NP role in the Australian context. Others have highlighted the challenges posed by the complex regulations surrounding reimbursement of NP services in the general practice setting, yet have noted that there is scope to achieve some financial sustainability (Helms *et al.* 2015). However, that analysis did not include case conferences (not reimbursed by the MBS) or home visits conducted by an NP, which occurred in the present study. Although home-based assessments are associated with time inefficiencies, they do provide valuable information about patients with suspected dementia that is not evident in practice-based consultations (Convery *et al.* 2013). Nonetheless, there may be scope for the DACNP to reduce the time taken to conduct assessments and prepare reports without comprising the quality of the work. Other possibilities for financial sustainability would be to engage the DACNP as a salaried employee within the public health system or to have the practice nurse conduct some of the assessments in collaboration with the GP, using MBS item numbers available to the practices. Since the time of this study, more salaried aged care NP positions have been created, but financial constraints are mitigating against NPs providing care to people within the community (Davey *et al.* 2015; Ervin *et al.* 2019). Policy change to allow this funding should be considered, given that access to dementia

**Table 4. Patient and carer satisfaction survey results**Data are given as *n* (%). NA, not applicable

Survey question	Option	Patients ( <i>n</i> = 28)	Carers ( <i>n</i> = 10)
Was the length of assessment acceptable?	Yes	28 (100)	9 (90)
	No	0 (0)	0 (0)
	Missing	0 (0)	1 (10)
How useful did you find the interview with the nurse?	Very or somewhat useful	26 (92.9)	9 (90)
	Uncertain	2 (7.1)	0 (0)
	Not very useful or no use at all	0 (0)	0 (0)
	Missing	0 (0)	1 (10)
Would you recommend this interview process to others?	Yes	26 (92.9)	10 (100)
	No	0 (0)	0 (0)
	Missing	2 (7.1)	0 (0)
How did you find the examination?	Liked it	27 (96.4)	9 (90)
	Neither liked nor disliked it	1 (3.6)	1 (10)
	Disliked it	0 (0)	0 (0)
	Unsure	0 (0)	0 (0)
How did you feel about the nurse and doctor checking your memory and concentration? (Patients only)	Reassured	25 (89.3)	NA
	Neutral	0 (0)	NA
	Irritated	1 (3.6)	NA
	Unsure	2 (7.1)	NA
How did you feel about the nurse and doctor asking you questions about your role as a carer? (Carers only)	Reassured	NA	8 (80)
	Neutral	NA	1 (10)
	Irritated	NA	0 (0)
	Unsure	NA	1 (10)

assessment services is limited in disadvantaged areas such as those from which patients were drawn for the present study.

## Conclusion

Elements of the model presented here offer a viable process to addressing some of the barriers to early diagnosis, assessment and management of dementia patients within general practice. The DACNPs expertise in dementia care and their capacity to conduct a comprehensive assessment in patients' homes overcame some of the knowledge gaps and time and financial constraints that pose barriers to some GPs making a timely diagnosis. Moreover, the DACNP service was in high demand from GPs, highly acceptable to patients and their carers and successfully provided early diagnosis and assessment of dementia, thereby improving access to care for this at-risk group. The ongoing collaborative relationship with a patient's GP is also more likely to deliver a superior standard of service than can be achieved by an individual health professional working alone (Reuben *et al.* 2013; Dodd *et al.* 2015). Further research should explore the long-term financial viability of the model, along with the effect on GPs' workloads, because there is conflicting evidence in this regard (Clark *et al.* 2013).

## Conflicts of interest

Dimity Pond has received funding from Nutricia for services on an advisory board in the past 3 years. She is not currently serving on the Board. The remaining authors have no conflicts of interest to declare.

## Acknowledgements

This project was funded by the Australian Department of Health and Ageing as part of the Nurse Practitioner – Aged Care Models of Practice Program.

The authors thank Bryony Goldthorp, Debbie Mutton and Evelyn Mueller for their invaluable contributions to this study.

## References

- Alexopoulos GS, Abrams RC, Young RC, Shamoian CA (1988) Cornell scale for depression in dementia. *Biological Psychiatry* **23**, 271–284.
- Aminzadeh F, Molnar FJ, Dalziel WB, Ayotte D (2012) A review of barriers and enablers to diagnosis and management of persons with dementia in primary care. *Canadian Geriatrics Journal* **15**, 85–94. doi:10.5770/cgj.15.42
- Bucks RS, Ashworth DL, Wilcock GK, Siegfried K (1996) Assessment of Activities of Daily Living in Dementia: Development of the Bristol Activities of Daily Living Scale. *Age and Ageing* **25**, 113–120.
- Byrne GJ, Pachana NA (2011) Development and validation of a short form of the Geriatric Anxiety Inventory – the GAI-SF. *International Psychogeriatrics* **23**, 125–131. doi:10.1017/S1041610210001237
- Carver CS (1997) You want to measure coping but your protocol's too long: consider the brief cope. *International Journal of Behavioral Medicine* **4**, 92–100.
- Clark S, Parker R, Prosser B, Davey R (2013) Aged care nurse practitioners in Australia: evidence for the development of their role. *Australian Health Review* **37**, 594–601. doi:10.1071/AH13052
- Convery P, Pond D, Goode S (2013) A feasibility study of a nursing intervention to assist general practitioners with best practice identification and management of dementia. (University of NSW, Dementia Research Collaborative Centre: Sydney, NSW, Australia) Available at [http://www.dementiaresearch.org.au/images/dcrc/output-files/629-digp5\\_report.pdf](http://www.dementiaresearch.org.au/images/dcrc/output-files/629-digp5_report.pdf) [Verified 10 May 2020]
- Currie J, Chiarella M, Buckley T (2016) Workforce characteristics of privately practicing nurse practitioners in Australia: results from a national survey. *Journal of the American Association of Nurse Practitioners* **28**, 546–553. doi:10.1002/2327-6924.12370
- Davey, R, Clark, S, Goss, J, Parker, R, Hungerford, C, Gibson, D (2015) National Evaluation of the nurse practitioner — aged care models of practice initiative: summary of findings. (Centre for Research & Action

- in Public Health, UC Health Research Institute, University of Canberra: Canberra, ACT, Australia) Available at <https://researchoutput.csu.edu.au/ws/portalfiles/portal/19842075> [Verified 11 May 2020]
- Dementia Australia (2020) Dementia statistics. (Dementia Australia: Canberra, ACT, Australia) Available at <https://www.dementia.org.au/statistics> [Verified 22 January 2020]
- Dodd E, Cheston R, Ivanecka A (2015) The assessment of dementia in primary care. *Journal of Psychiatric and Mental Health Nursing* **22**, 731–737. doi:10.1111/jpm.12250
- Ervin K, Reid C, Moran A, Opie C, Haines H (2019) Implementation of an older person's nurse practitioner in rural aged care in Victoria, Australia: a qualitative study. *Human Resources for Health* **17**, 80. doi:10.1186/s12960-019-0415-z
- Haines HM, Critchley J (2009) Developing the nurse practitioner role in a rural Australian hospital: a Delphi study of practice opportunities, barriers and enablers. *The Australian Journal of Advanced Nursing* **27**, 30–36.
- Helms C, Crookes J, Bailey D (2015) Financial viability, benefits and challenges of employing a nurse practitioner in general practice. *Australian Health Review* **39**, 205–210. doi:10.1071/AH13231
- Koch T, Iliffe S (2010) Rapid appraisal of barriers to the diagnosis and management of patients with dementia in primary care: a systematic review. *BMC Family Practice* **11**, 52. doi:10.1186/1471-2296-11-52
- Koshy E, Koshy V, Waterman H (2010) 'Action research in healthcare.' (SAGE Publications: London, UK)
- KPMG (2018) Cost benefit analysis of nurse practitioner models of care. Department of Health November 2018 report. Available at [https://www1.health.gov.au/internet/main/publishing.nsf/Content/424787040165EBABCA258470001C35EE/\\$File/Cost%20Benefit%20Analysis%20of%20Nurse%20Practitioner%20Models%20of%20Care%20report.pdf](https://www1.health.gov.au/internet/main/publishing.nsf/Content/424787040165EBABCA258470001C35EE/$File/Cost%20Benefit%20Analysis%20of%20Nurse%20Practitioner%20Models%20of%20Care%20report.pdf) [Verified 14 April 2020]
- Logsdon RG, Gibbons LE, McCurry SM, Teri L (2002) Assessing quality of life in older adults with cognitive impairment. *Psychosomatic Medicine* **64**, 510–519.
- Lovibond PF, Lovibond SH (1995) The structure of negative emotional states: comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. *Behaviour Research and Therapy* **33**, 335–343. doi:10.1016/0005-7967(94)00075-U
- MacLellan L, Higgins I, Levett-Jones T (2015) Medical acceptance of the nurse practitioner role in Australia: a decade on. *Journal of the American Association of Nurse Practitioners* **27**, 152–159.
- Maier CB, Aiken LH (2016) Task shifting from physicians to nurses in primary care in 39 countries: a cross-country comparative study. *European Journal of Public Health* **26**, 927–934. doi:10.1093/eurpub/ckw098
- Mason R, Doherty K, Eccleston C, Winbolt M, Long M, Robinson A (2020) Effect of a dementia education intervention on the confidence and attitudes of general practitioners in Australia: a pretest post-test study. *BMJ Open* **10**, e033218. doi:10.1136/bmjopen-2019-033218
- Medicare Benefits Schedule Review Taskforce (2018) Report from the nurse practitioner reference group. (Department of Health: Canberra, ACT, Australia) Available at [https://www1.health.gov.au/internet/main/publishing.nsf/content/BEB6C6D36DE56438CA258397000F4898/\\$File/NPRG%20Final%20Report%20-%20v2.pdf](https://www1.health.gov.au/internet/main/publishing.nsf/content/BEB6C6D36DE56438CA258397000F4898/$File/NPRG%20Final%20Report%20-%20v2.pdf) [Verified 21 December 2020]
- Minstrell M, Bentley M, Bucher H, Morrissey M, Higgs C, Robinson A, Stirling C (2015) Open referral policy within a nurse-led memory clinic: patient demographics, assessment scores, and diagnostic profiles. *International Psychogeriatrics* **27**, 967–979. doi:10.1017/S1041610214002361
- Nursing and Midwifery Board of Australia (2016) Registration standard: endorsement as a nurse practitioner. (AHPRA: Canberra, ACT, Australia) Available at <https://www.nursingmidwiferyboard.gov.au/registration-standards/endorsement-as-a-nurse-practitioner.aspx> [Verified 21 December 2020]
- Pond CD (2017) The role of primary care in identification and ongoing management of dementia: a time of transition. *International Psychogeriatrics* **29**, 1409–1411. doi:10.1017/S1041610217001296
- Pond CD, Mate KE, Phillips J, Stocks NP, Magin PJ, Weaver N, Brodaty H (2013) Predictors of agreement between general practitioner detection of dementia and the revised Cambridge Cognitive Assessment (CAMCOG-R). *International Psychogeriatrics* **25**, 1639–1647. doi:10.1017/S1041610213000884
- Prince M, Comas-Herrera A, Knapp PM, Guerchet M, Karagiannidou M (2016) 'World Alzheimer report 2016: improving healthcare for people living with dementia coverage.' (ADI: London, UK)
- Reuben DB, Ganz DA, Roth CP, McCreath HE, Ramirez KD, Wenger NS (2013) Effect of nurse practitioner comanagement on the care of geriatric conditions. *Journal of the American Geriatrics Society* **61**, 857–867. doi:10.1111/jgs.12268
- Roth M, Huppert FA, Mountjoy CQ, Tym E (1988) 'CAMDEX: the Cambridge Examination for Mental Disorders of the Elderly.' (Cambridge University Press: Cambridge, UK)
- Swerissen H, Duckett S, Moran G (2018) Mapping primary care in Australia. Available at <https://grattan.edu.au/wp-content/uploads/2018/07/906-Mapping-primary-care.pdf> [Verified 1 November 2020]
- Tilburgs B, Vernooij-Dassen M, Koopmans R, van Gennip H, Engels Y, Perry M (2018) Barriers and facilitators for GPs in dementia advance care planning: a systematic integrative review. *PLoS One* **13**, e0198535. doi:10.1371/journal.pone.0198535
- Wendrich-van Dael A, Bunn F, Lynch J, Pivodic L, Van den Block L, Goodman C (2020) Advance care planning for people living with dementia: an umbrella review of effectiveness and experiences. *International Journal of Nursing Studies* **107**, 103576. doi:10.1016/j.ijnurstu.2020.103576
- Woods B, Arosio F, Diaz A, Gove D, Holmerová I, Kinnaird L, Mátlová M, Okkonen E, Possenti M, Roberts J (2019) Timely diagnosis of dementia? Family carers' experiences in 5 European countries. *International Journal of Geriatric Psychiatry* **34**, 114–121. doi:10.1002/gps.4997
- World Health Organization (WHO) (2007) Task shifting to tackle health worker shortage. Available at [https://www.who.int/healthsystems/task\\_shifting\\_booklet.pdf](https://www.who.int/healthsystems/task_shifting_booklet.pdf) [Verified 20 July 2020]
- World Health Organization (WHO) (2020) WHOQOL: measuring quality of life. Available at <https://www.who.int/tools/whoqol/whoqol-bref/docs/default-source/publishing-policies/whoqol-bref/english-australian-whoqol-bref> [Verified 10 May 2020]
- Zarit S, Reeve K, Bach-Peterson J (1980) Relatives of impaired elderly: correlates of feelings of burden. *Gerontologist* **20**, 373–377.